



**Testimony of Fred Yoder  
Chairman  
National Corn Growers Association**

**Subcommittee on Conservation, Credit, Rural Development, and Research**

**Review of Agricultural Biotechnology**

**Washington, DC  
June 23, 2004**

Good morning. Chairman Lucas, Ranking Member Holden and members of the Subcommittee, my name is Fred Yoder. I am Chairman of the Board for the National Corn Growers Association (NCGA) and past Chairman of the NCGA's Biotechnology Working Group. I would like to thank the Subcommittee for giving me the opportunity to testify and speak today regarding agriculture biotechnology.

The National Corn Growers Association is an organization founded in 1957 and represents more than 33,000 dues-paying corn growers from 48 states. The Association also represents the interests of more than 300,000 farmers who contribute to corn checkoff programs in 19 states.

The National Corn Growers Association's mission is to create and increase opportunities for corn growers in a changing world and to enhance corn's profitability and usage across this country. Biotechnology remains vital to the future of corn growers as we search for new markets and provide grain that is more abundant and of better quality.

Biotechnology offers corn growers improved efficiencies and potential profits when managed wisely and with regulatory oversight based on sound science. The introduction of new varieties of corn and their proliferation across the Corn Belt is redefining current systems of price discovery, consumer information, health regulation and trade management.

***Biotechnology Varieties in Corn***

Existing biotech corn has two main traits, herbicide tolerance and insect resistance. Herbicide tolerant crops can withstand broad-spectrum herbicides that are effective against harmful weeds. This allows farmers to spray less often with just one herbicide and often reduces the need for tillage, which reduces soil runoff. The vast majority of the biotech crops planted are herbicide tolerant. Pest resistant crops have been enhanced with naturally occurring pesticides. The most common protein is *bacillus thuringiensis*, or Bt. This protein wards off crop-eating insects like rootworm, bollworm and the European corn borer.

Currently, thirteen biotech corn varieties are approved in the United States for commercial use, three of which are herbicide-resistant, three are insect resistant and the other seven are stacked varieties. Stacked trait crops combine two or more traits in the same crop.<sup>1</sup>

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<sup>1</sup> For more information, please visit the NCGA "Know Before You Grow" website at [http://lepton.marz.com/ncga/search\\_hybrids/know\\_where.asp](http://lepton.marz.com/ncga/search_hybrids/know_where.asp).

## ***Producer Acceptance***

As you know, corn is the largest crop in the United States, with over 79 million acres planted last year, producing 10 billion bushels of grain. Corn acreage is likely to increase this year with nearly half devoted to varieties derived from biotechnology<sup>2</sup>. Corn producers across the country are already learning about the benefits of biotechnology and we expect acceptance rates to continue to climb in the foreseeable future.

Acceptance rates for agriculture biotech in corn and other crops rests primarily on the economic and environmental benefits. As small businessmen, farmers like me understand the importance of minimizing risk and increasing returns on investment. Agriculture biotech helps maximize benefits unlike any innovation since the introduction of the tractor. In fact, according to the Council on Biotechnology Information (CBI), average profits in corn range between five dollars to as much as sixty dollars per acre. As cited earlier, biotechnology has contributed to this rise by allowing corn growers to reduce chemical applications energy use and devote fewer man hours to produce the same bushel of grain.

It is important to point out that acceptance rates for biotech corn varieties are not linear from year to year. As the attached chart illustrates, biotech plantings dipped between 1999 and 2001. Several factors explain this pattern. First, in 1998, the European Union (EU) imposed a moratorium on approvals of new products derived from biotechnology. This effectively halted bulk commodity shipments of corn to the EU. Farmers decided to delay additional plantings in future years until a stable marketplace re-emerged. Second, the discovery of StarLink corn in the food chain had an impact on plantings in the next crop year. Lastly, pest pressures during this period were not significant so farmers chose to plant other hybrid varieties. However, emergence of corn borer and rootworm infestation damaged the corn crop and accelerated plantings after 2001.

Furthermore, asynchronous approvals in the international market and geographic differences are dominant factors for different adoption rates for biotech varieties in the Corn Belt. For example, when evaluated state-by-state, Iowa, Illinois, Minnesota and Nebraska account for sixty percent of the value of biotech corn production (see attached chart).

## ***Environmental Benefits***

While the environmental benefits of agriculture biotech are well known, it is helpful to highlight them nonetheless. As you know, agriculture biotech has led to a significant increase in the adoption of environmentally friendly no-till farming practices. No-till farming conserves top soil, preserves soil moisture, reduces energy requirements and lessens runoff while the crop residue from the previous year is left standing. In addition, biotech varieties help enable farmers to use more benign herbicides that rapidly dissipate in soil and water.

From a global perspective, the adoption of no-till farming practices significantly reduces the release of greenhouse gas emissions, which may help slow global warming. (In contrast, when cultivated soil is exposed to air, organic matter is oxidized, releasing carbon dioxide — an ozone-depleting gas — into the atmosphere).

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<sup>2</sup> Forty-six percent of all U.S. corn acres were planted with biotech corn in 2002, up from 40 percent in 2003.

Overall, agriculture biotech has reduced the amount of pesticides used in U.S. production by 46 million pounds. As additional biotech varieties are introduced, more than 163 million pounds of pesticides could be eliminated from current cropping practices. Specifically, farmers planting biotech corn varieties increased production by 3.5 million pounds of corn in 2001. The increased efficiency resulted primarily by saving crops that would otherwise have been destroyed by European and Southwestern corn borers. This ultimately generated an additional \$183.4 million in revenue for farmers while reducing pesticide use by 8.4 million pounds.

It is important to note that not all U.S.-grown biotech hybrids are approved in major export markets and therefore should not be placed into export channels. NCGA advises its members to avoid potential trade disruption with our export customers and to take the necessary steps to keep biotech grain in the domestic distribution chain where necessary. As you know, this is primarily an issue with the European Union. However, with the proliferation of multilateral environmental agreements (MEAs) like the Biosafety Protocol, it is likely agricultural producers in the United States will be faced with even greater requirements to channel products for export customers.

Farmer acceptance of additional biotech varieties will largely rest in a simple cost/benefit analysis. Innovations in the first wave of agriculture biotech relied on single agronomic traits focused on crop production and pest management. However, farmers like me will demand greater efficiencies and yields before increasing biotech corn acres in production.

### ***Future Innovations***

The future of agriculture biotech is exciting and rich with promise. The second wave of innovations will increase trait stacking and focus on plant performance.

A major factor affecting the reduction in corn grain yields in the United States and the rest of the world is water stress. Every corn field is impacted by water stress to some degree. Not only are some acres not available for growing corn because of insufficient water, yields may be reduced or inconsistent on the remainder of acres. Corn is the second largest user of agricultural irrigation which increases potential conflict for available water, especially in the drought prone western United States.

To remain profitable and competitive, U.S. farmers need access to technologies that help them consistently grow a high yielding and high quality corn crop. NCGA is supportive of the application of biotechnology to create corn crops that maintain high yields under water stress. Drought tolerant corn plants produced by biotechnology are currently being tested for their tolerance to water stress and it will be several years before they are approved and commercialized.

Perhaps the most notable trait recently introduced in corn hybrids prevents damage from the rootworm. The United States Department of Agriculture (USDA) estimates the pest causes one billion dollars in lost revenue annually to the U.S. corn crop. The Environmental Protection Agency (EPA), estimates corn rootworm is responsible for the single largest use of conventional insecticides in the United States.

According to the National Center for Food and Agriculture, adoption of new rootworm-resistant varieties in threatened areas could reduce chemical spraying by an additional 14 million pounds. Furthermore, experts believe rootworm corn could eventually be grown on 15 to 25 percent of corn acres in the United States, boosting yields and saving additional dollars on agricultural inputs.

Looking forward, the National Corn Growers Association is working with a technology provider to develop nematode resistance in corn. Nematodes currently reduce corn yield by three to seven percent. Many chemical nematode control options are under review and are likely to be removed from the market due to their environmental and health hazards. This could lead to a situation in which growers have very limited nematode control options. Our research is working to allow growers to protect their crops while they protect their health and the health of their communities.

These input traits are best characterized as “low hanging fruit” and technology providers are nearing introduction of varieties that are more complex and easier to grasp by consumers. While input traits will continue to be of interest to corn farmers, maximizing value for the consumer and processors will necessitate the commercialization of output traits that have value in the marketplace beyond the farm gate.

A clear path for commercializing output traits is to develop those that have the shortest path to the consumer. The corn industry currently has a number of established markets. Two of which are the ethanol dry mill and livestock industries.

There are corn varieties in the pipeline that will increase the efficiency and yield of ethanol production while reducing energy costs. They will also produce a higher quality output of distillers dried grains with solubles (DDGS). Since many of the new ethanol dry mills operating and in construction are grower owned, this will mean more opportunities for growers to capitalize on value added ventures in rural America.

Research is also focused on livestock nutrition. The livestock industry consumes more corn than any other market segment (57 percent) and will likely use a greater share of the nation’s corn crop in the future. Biotechnology can facilitate delivery of essential nutrients, and increase bone health while reducing pollution. Research is ongoing, increasing the presence of phytase, improving amino acid content, increasing Vitamin B3 and Omega-3 fatty acids while controlling the presence of parasitic worms.

Lastly, corn can help deliver essential nutrients through food enhancement. These innovations are best separated into two categories, those that benefit all consumers and those that benefit consumers in developing nations.

Obviously, developed nations have different health profiles than developing countries. For example, although Vitamin A deficiency does occur in the United States, it is rare compared to deficiencies in developing nations. The key health concerns in developed countries are cardiovascular disease and cancer. Consumers are very interested in having access to foods that can facilitate therapies like antioxidants and lycopene.

Research cites lycopene as being important in protection from prostate cancer. While the biosynthetic pathway is well understood in tomatoes and other organisms, it appears that there is increased bioavailability when lycopene is consumed with oils from corn. This would seem to indicate lycopene would be a good candidate for expression in corn plants. In addition, one of the technology providers is working to develop plant derived oils that have a much better composition for cardiovascular health. These oils may be able to reduce this risk of heart disease by as much as forty to fifty percent.

## **Consumer Acceptance**

If there is one challenge that looms on the horizon that is of greatest concern to corn growers is consumer acceptance. Consumer acceptance and confidence in our regulatory agencies is vital to the success of this technology. As producers, corn growers have to be mindful of our customers and ensure there is open communication with grain handlers, millers, processors and food retailers across the country. Our association works closely with our partners in the food chain continuing an open dialogue to head off any problem before it occurs.

We also believe consumer acceptance of biotechnology will increase with the dissemination of science-based information. Responsible and accountable management by biotechnology providers, producers, suppliers and grain merchandisers is imperative. While consumers see advantages in food developed with biotechnology, we cannot squander the good will and confidence built up over the past decade. We need to reach out both domestically and internationally to enhance consumer attitudes. We need only look to the European Union to see the results of neglecting this critical constituency.

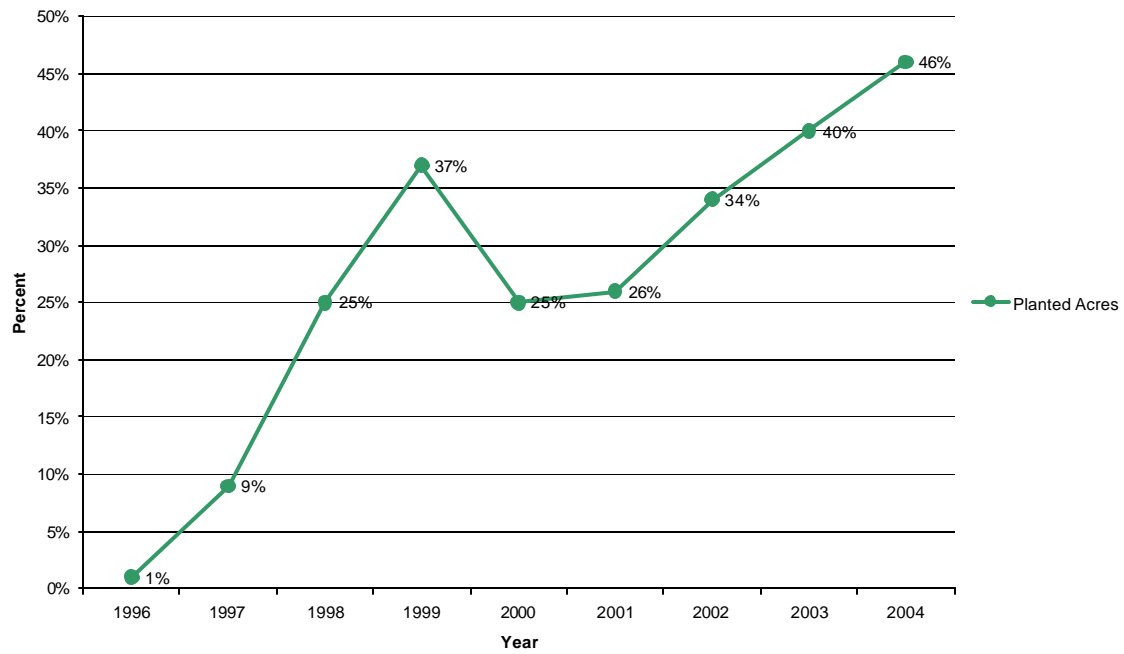
## **Conclusion**

Corn growers have a unique opportunity to take part in one of the most important changes in agriculture in history. The development of agriculture biotech offers a fantastic opportunity for increasing the value of the corn crop, as well as significantly benefiting consumers. By working with private sector groups like the AgBiotech Planning Committee, agriculture associations can help facilitate adoption while ensuring proper stewardship. Government needs to ensure regulatory agencies like the Animal and Plant Health Inspection Service (APHIS), EPA and the Food and Drug Administration (FDA) are properly funded and have the tools to do their job.

Together, we can ensure U.S. agriculture remains a leader in technological innovation and production of corn. To be sure, the future of agriculture biotechnology is filled with uncertainty, but we stand ready to confront the challenges that await us. We have so much to lose if we do not move ahead.

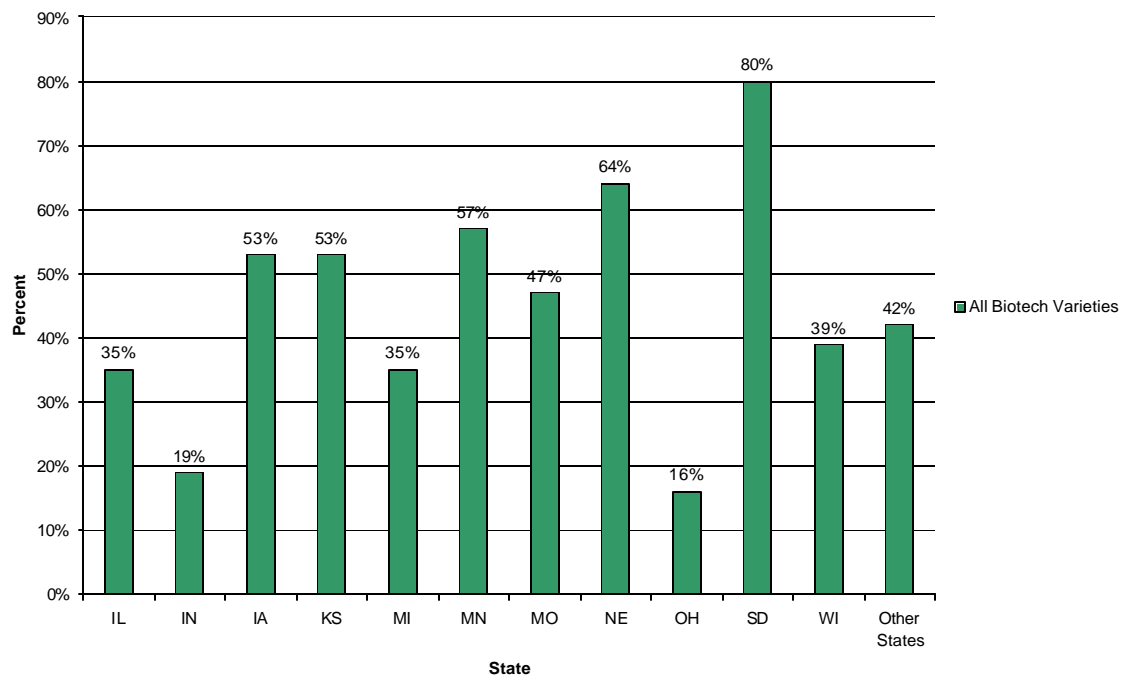
We look forward working with the Subcommittee on this and other issues of importance in the future. I thank you again for the opportunity to address the Subcommittee and welcome your questions.

**Adoption Rate of Biotech Corn Varieties  
Planted Acres in the United States**



Source: USDA, NASS

**State-by-State Biotech Acceptance**



Source: USDA, NASS